

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

Claims 1-26 (Canceled)

27. (Currently Amended) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, the method comprising the step of:

setting a quiescent period, in which all the scanning signal lines are set in non-scanning state, to be longer than a scanning period required for scanning each scanning signal line of the screen at least one time, wherein a sum of the scanning period and the quiescent period is set to be equivalent to one vertical period.

28. (Original) The method of driving a display device as set forth in claim 27, wherein:
a non-scanning period including the quiescent period is selected among a plurality of non-scanning periods.

29. (Currently Amended) ~~The method of driving a display device as set forth in claim 28, further comprising~~ A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and

~~supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line, the method comprising the step of:~~

~~_____ setting a quiescent period, in which all the scanning signal lines are set in non-scanning state, to be longer than a scanning period required for scanning the screen one time, wherein a sum of the scanning period and the quiescent period is set to be equivalent to one vertical period, and~~

~~_____ wherein a non-scanning period including the quiescent period is selected among a plurality of non-scanning periods, the step of setting a frame period equal to a sum of the scanning period and a respective non-scanning period to allow using a common reference synchronous signal among non-scanning periods, the frame period satisfying the condition of:~~

~~wherein $(T1 + T02) = (T1 + T01) \times N$ (N is an integer of not less than 2), and~~

~~wherein $T1$ is the scanning period, $T01$ is the shortest one of the plurality of said non-scanning periods, and $T02$ is a non-scanning period other than $T01$.~~

30. (Original) The method of driving a display device as set forth in claim 27,
said display device includes image data storage means for storing image data based on
which the data signal is produced, and
an operation of transferring the image data from said image data storage means is stopped
in the quiescent period.

31. (Original) The method of driving a display device as set forth in claim 27, wherein:
said display device includes image data supply means for supplying image data based on
which the data signal is produced, and
an operation of receiving a supply of the image data from said image data supply means is
stopped in the quiescent period.

32. (Original) The method of driving a display device as set forth in claim 27, wherein:
an operation of an analog circuit irrelevant to display is stopped in said quiescent period.

33. (Original) The method of driving a display device as set forth in claim 32, wherein:
an operation of at least an analog circuit of said data signal line driver is stopped in the
quiescent period.

34. (Original) The method of driving a display device as set forth in claim 27, wherein:
said data signal lines are all set in high-impedance state with respect to at least said data
signal driver for driving all of said data signal lines in the quiescent period.

35. (Original) The method of driving a display device as set forth in claim 34, wherein:
in said quiescent period, after setting said data signal lines all in high-impedance state, an
operation of an analog circuit irrelevant to display is stopped.

36. (Original) The method of driving a display device as set forth in claim 35, wherein:
in said quiescent period, an operation of at least an analog circuit of said data signal driver is stopped.

37. (Original) The method of driving a display device as set forth in claim 34, wherein:
said data signal lines are all set in high impedance state after setting them to have potential at which variation in data holding state of all the pixels are minimized on average.

38. (Original) A display device, comprising:
control means for executing said method of driving a display device of claim 27.

39. (Original) An electronic device adopting the display device of claim 38.

40. (Original) The method of driving a display device of claim 27, wherein:
said display device is a liquid crystal display device which includes a liquid crystal display element having pixels arranged in a matrix form in which a charge based on a data signal supplied through the data signal line is written periodically in an electric capacitance formed by interposing liquid crystal between a pixel electrode and a counter electrode via the active element as selected by a scanning signal to be supplied from the scanning signal line.

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41. (Original) The method of driving a display device of claim 40, wherein:
a non-selective voltage which substantially maximizes an OFF resistance value of the active element is applied to all of said scanning signal lines in the quiescent period.

42. (Currently Amended) ~~The method of driving a display device of claim 40, wherein:~~
A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal, the method comprising the step of:
setting a quiescent period, in which all the scanning signal lines are set in non-scanning state, to be longer than a scanning period required for scanning the screen one time, wherein a sum of the scanning period and the quiescent period is set to be equivalent to one vertical period,
and
wherein said quiescent period is set within a range of from 16.7 msec to not more than 2 sec.

43. (Currently Amended) The method of driving a display device of claim 42, wherein:
claim 40, wherein:
said quiescent period is set within a range of from 50 msec to not more than 1 sec.

44. (Original) A display device comprising:

control means for executing the driving method of a display device of claim 40.

45. (Original) The display device of claim 44, wherein:

said liquid crystal display element includes an auxiliary capacitance electrode which forms an auxiliary capacitance of the pixel with said pixel electrode, is formed so as not to be overlapped with said scanning signal lines.

46. (Currently Amended) ~~The display device as set forth in claim 45, A display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, said display device comprising:~~

~~a liquid crystal display element having pixels arranged in a matrix form in which a charge based on a data signal supplied through the data signal line is written periodically in an electric capacitance formed by interposing liquid crystal between a pixel electrode and a counter electrode via the active element as selected by a scanning signal to be supplied from the scanning signal line;~~

~~_____ control means for executing the driving method for the display device, the driving method including setting a quiescent period, in which all the scanning signal lines are set in a non-scanning state, to be longer than a scanning period required for scanning the screen one time,~~

wherein a sum of the scanning period and the quiescent period is set to be equivalent to one vertical period;

_____ an auxiliary capacitance electrode which forms an auxiliary capacitance of the pixel with said pixel electrode, and

wherein said liquid crystal display element has a pixel voltage holding ratio P satisfying the following condition of:

$$V_1 = V - \{ V \cdot (1 - Hr(T)) \times C_{LC} / (C_{LC} + C_{CS}) \}$$

$$P = V_1 \cdot \exp[-T / \{ (C_{LC} + C_{CS}) \cdot R \}] / V \geq 0.9,$$

wherein C_{LC} is an electric capacitance between the pixel electrode and the counter electrode, C_{CS} is the auxiliary capacitance, T is a non-selection period of the active element, Hr (T) is a liquid crystal voltage holding ratio after the non-selection period of T at the rewriting frequency, V is a potential difference between the pixel electrode and the counter electrode directly after writing, R is a resistance value of the active element in the non-selection period.

47. (Original) The display device as set forth in claim 44, wherein: said liquid crystal display element includes a reflective member which realizes a reflective-type display using surrounding light.

48. (Original) The display device as set forth in claim 47, wherein:
said reflective member constitutes at least a part of said pixel electrode.

49. (Original) The display device as set forth in claim 47, wherein:

said reflective member either has a hole for transmitting therethrough light or is semi-transmissive.

50. (Original) An electronic device adopting said display device of claim 44.

51. (Currently Amended) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, the method comprising the steps of:

forming a quiescent period subsequent to a scanning period required for scanning each scanning signal line of a screen at least one time, wherein the quiescent period has all the scanning signal lines set in non-scanning state and the quiescent period is longer than the scanning period, and

in said quiescent period, a potential of said data signal line is set to a predetermined data signal line quiescent potential.

52. (Original) The method of driving a display device as set forth in claim 51, wherein:
the data signal line quiescent potential of said data signal line in the quiescent period is set within a range of a voltage of the data signal to be supplied to the data signal line in said scanning period.

53. (Original) The method of driving a display device as set forth in claim 51, wherein:
the data signal line quiescent potential of said data signal line in a quiescent period is set to a center of an amplitude of a data signal to be supplied to said data signal line in said scanning period.

54. (Currently Amended) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, wherein:

a quiescent period, in which all the scanning signal lines are set in non-scanning state, is set to be longer than a scanning period required for scanning each scanning signal line of a screen at least one time, and

in the quiescent period, a potential of a counter electrode is set to a predetermined counter electrode quiescent potential.

55. (Original) The method of driving a display device as set forth in claim 54, wherein:
the counter electrode quiescent potential of said counter electrode in the quiescent period
is set within a range of a voltage of a counter electrode driving signal to be supplied to said
counter electrode in the scanning period.

56. (Original) The method of driving a display device as set forth in claim 54, wherein:
the counter electrode quiescent potential of said counter electrode in the quiescent period
is set to a center of an amplitude of the counter electrode driving signal to be supplied to said
counter electrode in the scanning period.

57. (Original) The method of driving a display device, wherein:
a potential of said data signal line in said quiescent period is fixed to the data signal line
quiescent potential by said method of any one of claims 51 to 53, and
a potential of the counter electrode in said quiescent period is set to a counter electrode
quiescent potential by said method of any one of claims 54 to 56.

58. (Original) The method of driving a display device as set forth in claim 57, wherein:
in said quiescent period, the potential of the data signal line and the potential of the
counter electrode are set to the data signal line quiescent potential and the counter electrode
quiescent potential respectively, and

subsequently, said data signal line is set in high-impedance state with respect to said data signal driver for supplying data signals to said data signal lines.

59. (Original) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, wherein:

subsequent to a scanning period required for scanning a screen one time, a quiescent period, in which all the scanning signal lines are set in non-scanning state, is formed so as to be longer than the scanning period, and

an AC driving signal, having a frequency of not more than that of the data signal to be supplied to the data signal line in the scanning period, is applied to the data signal line in the quiescent period.

60. (Original) The method of driving a display device as set forth in claim 59, wherein:

an amplitude of a driving signal to be applied to the data signal line in said quiescent period is set within a range of a voltage of a data signal to be supplied to the data signal line in the scanning period.

61. (Original) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and

supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, wherein:

subsequent to a scanning period required for scanning a screen one time, a quiescent period, in which all the scanning signal lines are set in non-scanning state, is formed so as to be longer than the scanning period, and

an AC driving signal, which is within a range of a voltage of a counter electrode driving signal to be supplied to said counter electrode in the scanning period and which has a frequency of not more than that of the counter electrode driving signal, is applied to the counter electrode in the quiescent period.

62. (Original) The method of driving the display device, wherein:

an AC driving signal is applied to the data signal line in the quiescent period by the method of driving a display device of claim 59 or 60,

an AC driving signal is applied to the counter electrode in the quiescent period by the method of driving a display device of claim 61, and

both of said driving signals have identical frequencies and phases.

63. (Original) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, wherein:

a quiescent period, in which all the scanning signal lines are set in non-scanning state, is set to be longer than a scanning period required for scanning a screen one time, and

an AC driving signal, which is within a range of a voltage of a counter electrode driving signal to be supplied to said counter electrode in the scanning period and which has a frequency of not more than that of the counter electrode driving signal, is applied to the said counter electrode and said data signal line in the quiescent period.

64. (Original) A method of driving a display device which displays by selecting and scanning each scanning signal line of a screen having pixels arranged in a matrix form and supplying through a data signal line a data signal to a corresponding pixel of the scanning signal line as selected, wherein:

subsequent to a scanning period required for scanning a screen one time, a quiescent period, in which all the scanning signal lines are set in non-scanning state, is formed so as to be longer than the scanning period, and

a DC driving signal, having a potential within a range of a voltage of a counter electrode driving signal to be applied to said counter electrode in the scanning period, is applied to said counter electrode and the data signal line in the quiescent period.

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65. (Original) A display device comprising control means which executes the driving method of the display device of any one of claims 51, 54, 59, 61, 63 and 64.

66. (Original) An electronic device mounting the display device of claim 65.